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Keyless Entry Systems

INSTALLATION MANUAL

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The Axeze System

Now you can say farewell to fumbling for keys, pushing buttons and swiping cards. Axeze has introduced a new era in keyless door entry.

The Axeze keyless Entry System is a low cost, self contained access system that provides the convenience of entering any secured area ... workplace or home ... without searching for keys.

A single Tag can be used anywhere security is necessary and easy access is desired. Axeze enables you to create a network of controlled entrances, providing access to multiple locations with a single Tag.

The system consists of a Controller unit (mounted internally), an antenna unit (normally mounted externally) and the Tag. If desired the antenna unit can be mounted inside or behind any non-metallic wall, keeping the electronics inside the building where they are safe from damage. (Controllers can be installed where desired, hidden from view.)

Security is enhanced, as all changes to the internal database must be done at the Controller unit, which is securely located inside the building.

A Master Programming Card (MPC) is supplied with each KES system. This card is used to program additional tags into the system, alternatively new tags can be programmed using Axeze Proprietary Software. We recommend the MPC is stored in a safe place because if it is lost the client will need to purchase Axeze Proprietary Software to program a new one.

Components of the system



The Controller

The Controller energises the transponder and decodes its reply. A microcomputer on board the Controller has been programmed to control the Controller as well as providing the appropriate switching and timing signals to the rest of the circuit. The microcomputer activates door entry on a valid card read by providing power to the 12V door lock (electric strike). An internal relay provides a switched contact to allow linking with other security systems. This is energised on a valid card read. The Controller board is protected from reverse voltage connection and over current with an on board fuse and circuitry.

Antenna Unit

The antenna read range is effected by the type of transponder used, the proximity to metal objects and background radio frequency noise. An electric buzzer (AAA) in the unit provides an audible indication of door entry status while a LED provides a visual indication of the system status.

Transponders

You have a choice of either a credit card transponder or key ring transponder to use with your new system. You can either carry your card on your person, or attach the key ring transponder to your keys. Holding the transponder within range of the reader will ensure that access is always reliable, quick and efficient. If you install several Axeze controllers you only need to carry one transponder as the same transponder can be programmed into all the controllers.

Plug Pack

A 450mamp plug Pack is required for the system and this can be plugged into any standard power outlet. For the neatest installation a non-switch outlet installed in the roof space is recommended.

Battery Backup Option

A sealed lead acid battery allows continued operation during a power failure. The battery is fuse protected using a 1.5 Amp quick blow M205 type fuse located on the board. If you don't install this option and you are unfortunate enough to have a power failure your door will stay in the locked position. You will need to revert to using a key to unlock your door during the power failure.

Battery

The PCB is designed to mount directly on the battery terminals. Due to different manufacturers specifications for the terminals we specify the Yuasa NP1.2-12 battery. The PCB may not fit correctly on some other batteries.

Door Status Option

The door strike energisation time is programmable and leaves the factory set at four (4) seconds. For difficult situations such as wheelchair access our technicians can program the unit to keep the latch open for up to 30 seconds. In these

situations the door status sensor should be enabled and a standard (normally open) security reed switch should be fitted and wired to the unit to shut off the strike as soon as the door is opened.

Door Strike

You will need to purchase an appropriate electric door strike from any reputable locksmith. The Axeze System works for both "Fail safe" and "Fail secure" strikes, however we strongly recommend that fail secure (requires power to open) type be used if a reliable backup power supply is not available. Protection from transients generated by the strike coil is built into the Controller.

Operation

Normal operation

During normal operation the LED on the antenna unit will flash red at one second intervals. Entry is achieved by placing a valid Tag in front of the antenna unit. An invalid read will turn the LED amber and the door will remain locked. A valid read will turn the LED to green and activate the door strike. Then simply push the door open. The existing door lock stays in the locked position so the door is automatically locked when closed.

Programming Tags

Our qualified technicians, installers or distributors do the programming. Tags can be easily added and removed, the door strike energisation time changed and the door status sensor option can be enabled. Programming requires Axeze proprietary software and either an MPC or laptop computer.

Using the MPC: The Master Programming Card allows you to program new Tags into your keyless entry system. All you need to do is contact the organisation you purchased your unit from and purchase new Tags. There are four types of Tags:

- Prox cards have the best read range;
- Keyring Tags are very convenient as you carry them on your keyring;
- Wrist band Tags are ideal for some situations;
- Tags embedded into some car keys;

Whichever Tag you prefer you can program it into the system yourself and it is so easy, but warning do not lose your MPC.

To Add A New Tag into your keyless entry system this is what you need to do.

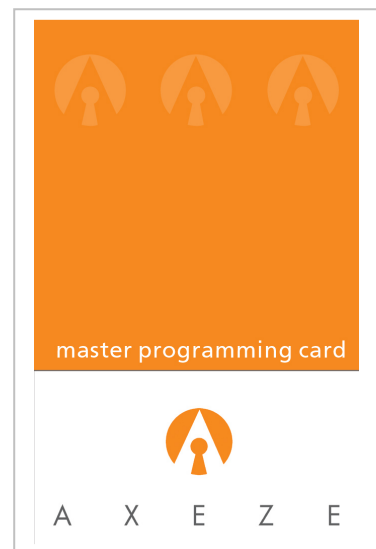
- 1) Ensure the system is connected up (it does not need to be installed);
- 2) Bring your MPC close to the antenna and hold it there for four seconds
- 3) When the MPC is detected the LED will change from flashing red to solid green;
- 4) HOLD it there for FOUR SECONDS the LED will change from solid green to solid red;
- 5) Present a new Tag;
- 6) When a Tag has been successfully added the LED will change to green for one second;
- 7) Repeat steps 5+6 to add all Tags you want to add into your Keyless Entry System;
- 8) When you are finished you can do one of two things:
 - Present the MPC to the system, or
 - Do nothing for 10 secondsThe system will return to its normal function flashing red.
- 9) When you have completed programming put your MPC away in a safe and secure place.

To Delete All Tags

- 1) Ensure the system is connected up (it does not need to be mounted);
- 2) Bring your MPC close to the antenna and hold it there for fourteen seconds (if you have a KEE then bring it close to your Keyless Entry System);
- 3) After the first four seconds the LED will change from Green to Red;
- 4) After another FIVE SECONDS the LED will change to solid yellow. This is a WARNING. It means you are about to delete every Tag (except the MPC) from your system. If you do not want to delete every Tag remove the MPC immediately.
- 5) After another FIVE seconds that is 14 seconds in all, the system will erase all of the Tags and change to green. Now you can program new Tags. Refer to "Add a New Tag" above.

If The MPC Is Lost. You can choose one of the following options:

- 1) You can contact the person you purchased your system from and purchase our KEMS software so that you can program a new MPC yourself, or
- 2) You can contact Axeze and arrange to send your Reader back to us to program a new MPC for you. (A small charge for programming, handling and mailing will be passed on to you.) or
- 3) You can look find our local distributor who will program a new MPC for you.

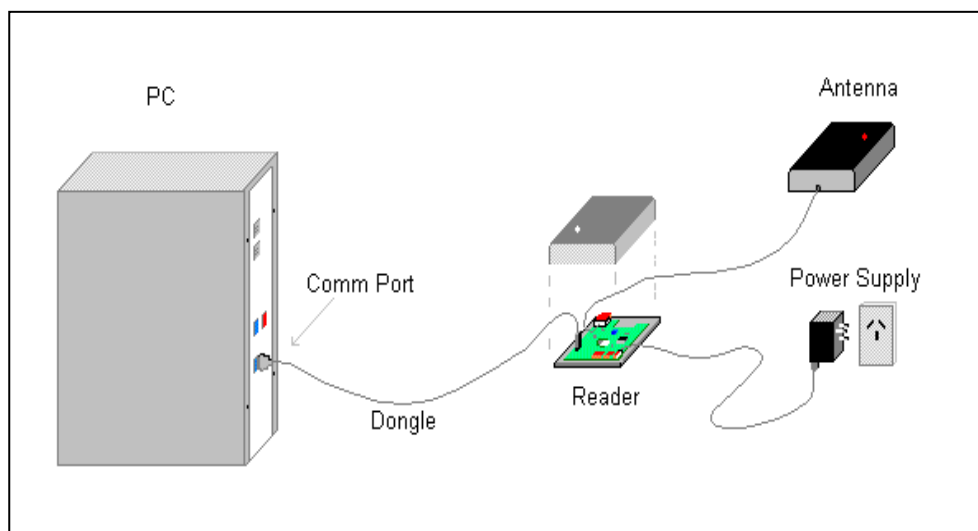


Using the Computer:

To add new Tags to the Controller's database:

- Plug the computer into the Controller **via** the special programming cable (AHL-PC) provided with your KEMS (Axeze programming software). Click on the Axeze icon and enter the Axeze screen.
- Load the software onto the computer.
- Upload the data stored in the Controller, wave the Tag past the antenna and note that it has been read on the computer. Hit "ADD" and type the cardholder's name into the name field for the new entry.
- After downloading the amended data into the Controller exit from the program.
- Remove the programming cable and check the Tags entered have been accepted. Note that the strike will not energise whilst the unit is in program mode. I

Note: If you use a Database be sure to open this file first.



Password protection

Password Protection is available for all clients. The password is stored on the Controller itself. Once set the client needs to remember it because it is so secure that if it is forgotten we cannot give you a backdoor password. All we can offer is a time zone where the Controller can be accessed temporarily.

There is an extensive programming manual available for clients who like to have hard copies of information. The KES does have extensive Help Screens, which address all aspects of the system. You can download this from www.axeze.com.au or contact Axeze.

Lost or Stolen Cards

If you lose your card, simply telephone us on +61-8-83408200 and we will arrange for a technician to come to your property and re-code your system with a new card and delete the lost card from the system. The new cards can only be coded by using Axeze proprietary software.

Security of the System

Security of the system is assured by having all circuitry other than the antenna on the secure side the door. The working circuitry is not accessible to anybody including our installers from the outside. Security is increased due to the huge number of possible combinations, the low power of the radiated energy and, the algorithm used. Your security is assured from even the most sophisticated electronic security attack.

Installation

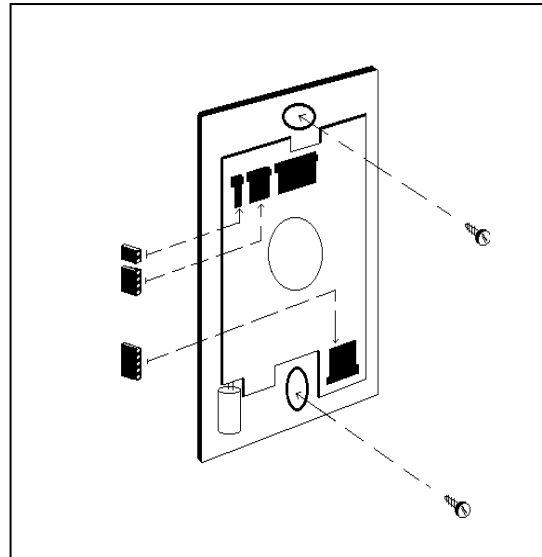
The Axeze unit can be retrofitted to an existing door latch or fitted to the new door on first installation.

Recommended Tools:

Electric Drill	25mm Wood Chisel	Additional for Masonry Wall
Stanley Knife	18mm Wood Chisel	Hammer Drill
Hammer	No. 2 Phillips Screw Driver	18mm Masonry Bit
Pencil	3mm Twist Bit (Pilot hole)	6mm Masonry Bit
Tape measure	18mm Spade Bit (Cable loom hole)	25mm Spade Bit

The Latch

- Mark out the faceplate making sure the striking area lines up with the existing latch.
- Or, if a new installation, mark the plate to match up with the latch on the door.
- Carefully chisel out the timber so the faceplate will fit securely and flush to the doorjamb.
- Once this is achieved, measure the latch mechanism and mark out a recess of suitable size (do not remove excess amounts of timber, as this will weaken the doorframe). Use a drill initially to remove the excess timber where the latch is to sink deep into the doorframe. Then with the chisel (using a sharp 18mm chisel) carefully pare away the timber, making sure to keep the shape of the latch in order to obtain a clean, secure, firm fit.
- Create a secondary recess for the latch mechanism to fit flush into the timber under the faceplate. Drill a hole through the doorjamb into the wall cavity just large enough for the wiring loom to pass through.
- Make electrical connections to the latch and feed the loom through to the Reader.
- Secure the latch mechanism with the screws provided, making sure to drill pilot holes to prevent timber splitting.
- Connect a 450mA power pack to a power outlet. (A licensed electrician is required to install a power point).
- Determine the position of your antenna unit on the exterior of the wall.
- Hold the back of the Reader to the desired position and mark off the three points for drilling. (A paper template is provided with the WPA style readers.)
- Drill hole A, (18mm) through wall for wiring loom.
- Drill holes at other points where previously marked. Diameter will vary depending on the material, 6mm wall plug (masonry wall, use masonry bit), 4mm for gyprock or pilot hole for timber.
- Mount both external and internal mounting plates using screws. Feed the power lead down through the cavity (making sure the power is not on) and using a small wire hook carefully retrieve the hanging wire from the cavity.
- Connect the leads from the antenna unit to the control unit and from the power source.



Once all the electrical connections are made carefully snap on the unit covers making sure to feed the excess wire into the wall.

The Axeze unit will show it is active by the red LED flashing.

If the light is not on check the power is on and all of the electrical connections were completed as instructed.

Check the unit with your Tag,

- Firstly add your tag using the Master Programming Card as per above.
- Now test your tag. When the indicator turns green your installation was successful.

If you have any problems call us on our Helpline +61-8-83408200.

Specifications

Reader Assembly

Height	110mm
Width	74mm
Depth	17.5mm
Voltage	8 to 20 VDC
Current at 12VDC (avg.)	50mA
Strike Type	12V AC or DC
Max Strike current	200mA (DC)
Relay contact rating	1 Amp @ 30VDC
Relay contact circuit	1 set COM-NO-NC
Typical Reading Distance	See table below
Storage Capacity	
Cards (with labels on database)	1000
Alpha/numeric characters per label (on database)	18
Communication (requires dongle and software)	RS232
Temperature range	-10 to +55 deg. C
Mounting holes spacing	83mm

Typical Reading Distance (mm)

Using 500mm 6 x 14/02 unshielded cable	On metal surface		15mm off metal surface		On Non-metallic surface	
	Card	Fob	Card	Fob	Card	Fob
	155	85	240	145	285	160

Key Fob

Length (excluding ring)	38mm
Diameter	10mm
Weight	4gms

Antenna Assembly

Height	110mm
Width	74mm
Depth	17.5mm
Mounting holes spacing	83mm

Cards

Length	86mm
Width	54mm
Thickness	Switzerland manufactured Thailand manufactured
	1.93mm 1.36mm
Weight	Switzerland manufactured Thailand manufactured
	12.5gms 13.2gms

Battery Charger

Height	80mm
Width	120mm
Depth	59mm
Input Voltage	15-20VDC
Output Voltage - Line available	13.8v
Output Voltage - Line unavailable	Battery Voltage
Battery Shut Down Voltage	9.5+/- 0.3v
Fuse	1.5Amp
Battery required to purchase (See text)	Yuasa NP1.2-12

Troubleshooting

Every Axeze unit is fully tested before it leaves the factory. The DIY installation kit included pre-terminated connected cables, which allow the modules to be assembled into a working system within minutes. If the supplied instructions are followed, there should be no problems.

If the red light on the Reader unit does not come on when power is applied, turn off the power immediately and check the wiring from the plug pack to the Controller. The two wires have most likely been reversed.

Note: Reversed wiring to the battery charger will damage the battery charger and void warranty on that unit.

If the Reader indicates power is on but the lights on the antenna do not come on at all, then the wiring to the antenna is faulty. Check the cable loom is correctly plugged in at both ends. If the loom has been lengthened check the wiring. The two ends should be wired in reverse order i.e. pin 1 on one plug goes to pin 5 on the other, pin 2 to pin 4, pin 4 to pin 2 and pin 5 to pin 1.

If the lights on the antenna come on but do not flash, then briefly short together pins 1 & 2 of the programming connector on the Controller unit. If this fixes the problem then place a shorting link permanently across these two pins. Pins 1 & 2 are the two pins closest to the red led.

Problem	Solution
No red light	Check that power is on and that polarity on DC wires is correct
Door won't open	Check that card is being validated and the beeper is sounding. Check door lock latch is not pushing too hard against the strike
Lost card	Find your normal key and use the lock. Call your installer to arrange for more card(s) or fob(s).
Won't sense card	Is card close enough? Has it been programmed?
Won't sense fob	Is the fob close enough? The fob has a normal read range of 160mm, but a brick wall could mean some applications will only work satisfactorily with card Tags

Warranty

Your Axeze keyless entry system is warranted to be free of manufacturing defects in materials and workmanship for a period of 12 months from date of shipment. Axeze Pty. Ltd. will, at its option, either repair or replace products, which prove to be defective and are returned to Axeze within this period. All freight charges are to be prepaid prior to faulty units being forwarded to Axeze. No other warranty, whether written or oral, is expressed or implied. Axeze Pty. Ltd. disclaims any implied warranties of merchantability and fitness for a particular purpose. In no event shall Axeze Pty Ltd be liable for any damages including loss of profits. The forgoing in no way diminishes the rights afforded by state legislation in the state of South Australia.

Frequently Asked Questions

How does it work?

Just hold the card or fob near the Reader and the door is unlocked. The Reader can be mounted inside or behind the wall, or on the outside wall. The electronics are kept inside where they are safe from intruders.

What if I loose my Master Programming Card?

You can purchase a new one from Axeze. You will need to purchase software so that you can load a new Master programming Card into your system. Contact Axeze www.axeze.com.au +61-8-83408200

How do I know if it is working?

The antenna known as the Reader, emits a messages to you. A red flashing light shows the unit is working, a yellow light says that you do not have entry and a green light allows immediate access.

How is it installed?

- You will need to purchase an electric door strike from any reputable locksmith.
- Plug a plugpack into a power point (usually installed in your roof), have a handyperson fit the units onto your wall, fit the electric strike into your architrave, and it is installed. There are two parts to the unit, one the antenna for the external area and the internal unit, which contains the electronics. The system uses mains power.

How do I get in during a Power Failure?

In order to avoid being locked out during a power failure, you can purchase the battery backup option. The battery is trickle fed with the mains power to ensure that it is fully charged for this very emergency. The system uses a lead acid battery, which can run for 20 or more hours (depending on age of the battery). The system will always stay locked during a power failure situation.

Do I have to keep a key anywhere?

No. The system is very safe. Only those people that you give your transponders too, can enter through the door. If you have a battery backup system fitted to your unit you will always be able to enter your property.

What about Deadbolts and deadlatches?

The system will work on deadbolt and deadbolts/deadlatch combinations. A special strike such as the Padde ES400/ES4000 is required. But once you install the Axeze unit you will not need to worry about deadbolts ever again. The system is so safe and so easy to use.

Can you address Multi User Sites?

Yes but you will need to purchase a Network System.

I would like to link this system into my computer and have it control the whole office/hotel etc.

You will need an Axeze network system to do this.

How many different tag numbers before a repeat?

There are millions of combinations before a repeat number. The range of numbers is 2^{64} , or 4.3 billion combinations.

Can it be used with dead locks? Yes.

What if I have a deadbolt and I want the system?

Sprint Intercoms sell an electric strike that operates with deadbolts. Warning: Ensure that the throw of the bolt is acceptable to the electric strike.

What happens when I loose my transponder (tag)?

1. For standalone systems you are supplied with a Master Programming Card. Use this card to program new tags.
2. You can purchase your own software and program your own tags and replacement Master Programming Tags.
3. You can contact your installer so that they can program a new tag for you and delete old ones from your database.

What is a transponder?

A transponder is a small portable electronic circuit, which sends a unique coded radio (RF) signal when stimulated by a special transceiver. It is low cost, carries no power, has extremely long life and is very secure.

How many doors can I enter with one transponder?

You can enter through millions of doors. Wherever the Axeze keyless solution is used you can enter. Your transponder must be programmed into each system before you will gain entry.

What happens during a power failure?

You can purchase our battery backup system which will give full operation of the unit for at least six hours. You can fall back on your conventional key because your door hardware does not change. Your existing locking system remains functional.

How far apart can the antenna be separated from the Controller?

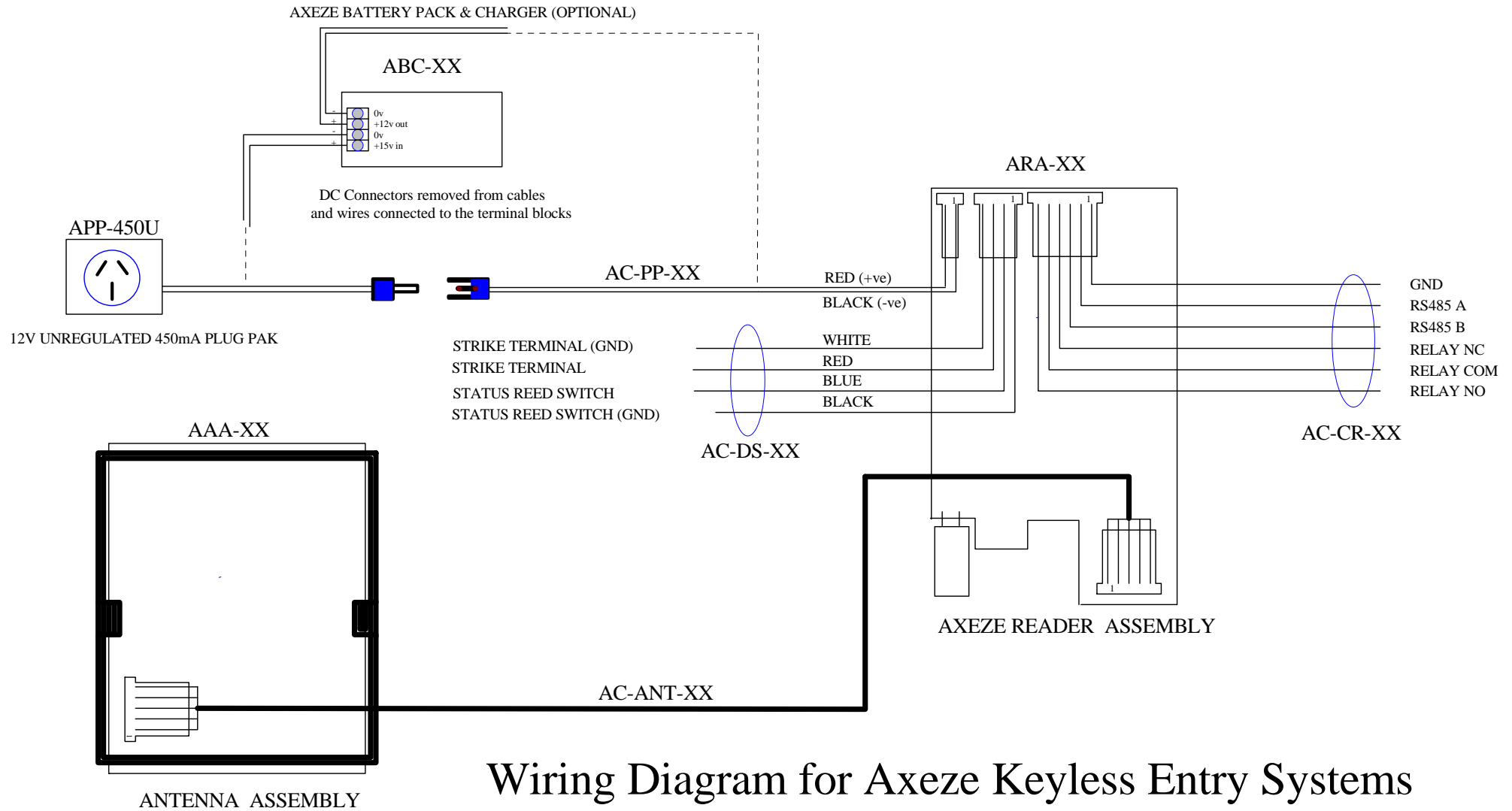
10metres using standard security cable. This can be extended but the system starts to develop "holes" within the read range from around 12mtrs. If you use shielded cable the Controller and antenna can be separated by up to 100mtrs but a much reduced read range will be achieved. Be careful when situating Controller electronic units in close proximity to each other as it is possible to get cross talk between antenna cables. If this is a problem use shielded cable for the antenna and connect the shield to GND at the Controller end only.

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Wiring Diagram

Push to Exit for the KES.

From firmware version 2.1 onwards, the Status Reed Switch input on the KES and KES-I products functions as a "Push to Exit" input when the "Sense door open" is not selected. A normally open switch is required and the door will unlock as if it was badged by a valid tag.



Wiring Diagram for Axeze Keyless Entry Systems